



Multipl skeletal muscle metastases from renal cell carcinoma after radical nephrectomy

Skeletal muscle metastases from renal cell carcinoma

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Abstract

Even if nephrectomy is applied to renal cell carcinoma, there is still a metastatic potential which cannot be estimated. In literature, very few cases have been reported of multiple skeletal muscle metastasis a long time after nephrectomy. A patient who has had a diagnosis of renal cell carcinoma, it must be kept in mind that there could be metastasis to the musculoskeletal system. In this paper, an uncommon case is discussed of multiple skeletal muscle metastasis determined 8 years after radical nephrectomy.

Keywords

Renal Cell Carcinoma; Skeletal Muscle; Metastasis

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Introduction

Even if curative nephrectomy is applied to renal cell carcinoma (RCC), there is still a metastatic potential which cannot be estimated [1]. RCC can metastasize to all tissues and is most frequently seen in the lungs, lymph nodes, bones, liver, and brain [2]. Skeletal muscle metastasis from RCC is extremely rare accounting %0,4 of all RCC metastasis [3]. In literature, very few cases have been reported of multiple skeletal muscle metastases [4]. In this paper, an uncommon case is discussed of multiple skeletal muscle metastasis determined 8 years after radical nephrectomy.

Case Report

A 70-year old male patient presented with complaints of swelling at the back of the left thigh and on the left shoulder, which had been ongoing for 6 months. The patient stated that the posterior thigh was painful only when he sat for long periods. There was no history of trauma, fever, sweating, weight loss or night-time pain. In the patient history, there was no additional disease, and it was seen that the patient had undergone left radical nephrectomy 8 years previously for a diagnosis of RCC. In the physical examination, fixed painless masses were determined that could be palpated deep in the posterior left thigh and the posterior left shoulder. There was no color change in the skin, no edema and no heat. On the magnetic resonance imaging (MRI), within the biceps femoris muscle, a well-defined mass was seen 50x38x27 mm in size, with a heterogeneous structure on T1-weighted slices with the signal resembling muscle, and on fat-suppressed T2-weighted slices, the major part showed intense contrast on the post-contrast series with a high signal (Figure 1).

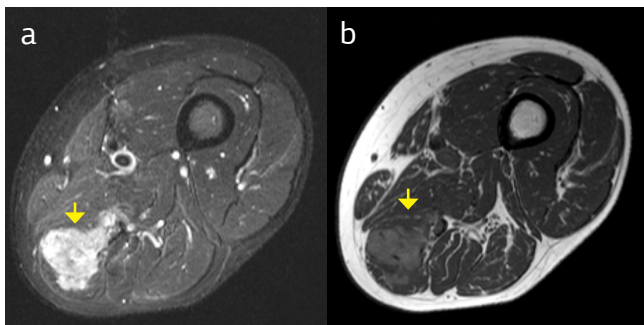


Figure 1. MRI shows a lesion, proximal portion of the biceps femoris muscle with high signal intensity on T2W1 (a) and low signal intensity on T1W1 (b).

On the left shoulder MRI, an ovoid mass lesion was observed adjacent to the posterior deltoid muscle with subcutaneous fat tissue localisation, approximately 20x28x20 mm in size with a signal similar to muscle on T1-weighted slices, and on fat-suppressed T2-weighted slices, areas of low signal within a heterogeneous internal structure and apart from these areas, a high signal in most parts (Figure 2). A subsequent fluorodeoxyglucose positron emission tomography (FDG-PET) scan exhibited a maximum standard value of 2.6 for the hypermetabolic lesion in the left deltoid muscle, suggestive of metastases (Figure 2). Primary soft tissue tumor and metastasis were first considered for the patient and biopsies were planned for both lesions to confirm the diagnosis. As a result of the biopsy examinations, the patient was evaluated for RCC metastasis (Figure 3). Wide resection was applied to both masses. At 14 months postoperatively, no recurrence was determined.

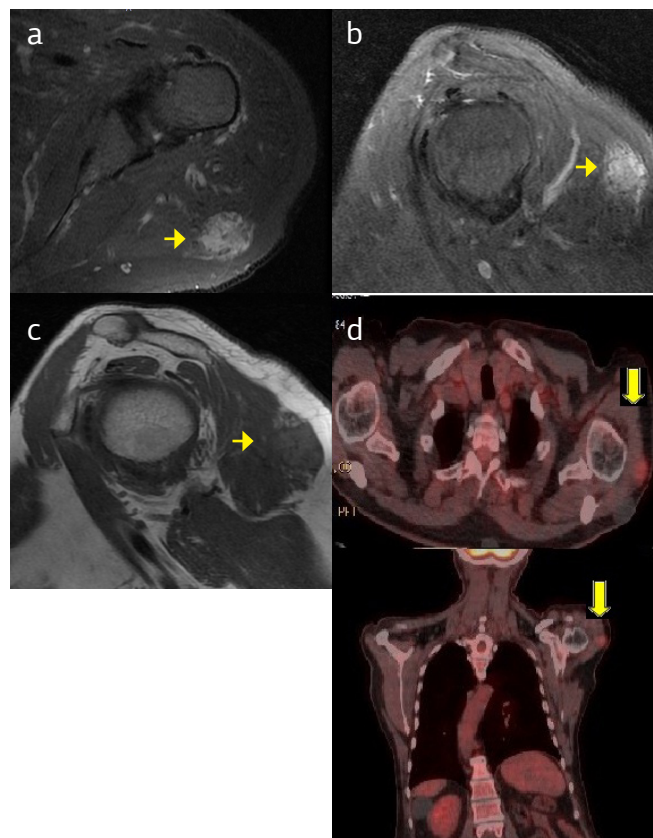


Figure 2. MRI shows a lesion, proximal portion of the deltoid muscle with high signal intensity on T2W1 (a and b) and low signal intensity on T1W1 (c), FDG-PET image shows hypermetabolic activity in the deltoid muscle with a maximum standard uptake value of 2.6 (arrowhead) (d).

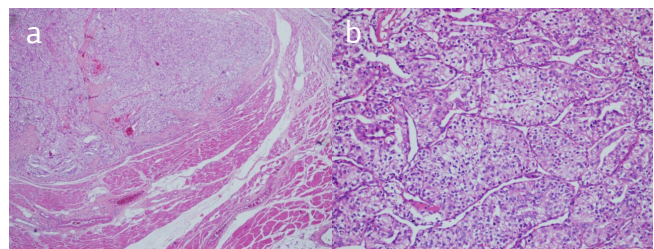


Figure 3. Histopathological evaluation: Renal cell carcinoma metastasis to biceps femoris muscle (a) (Hematoksilen&Eozin X40) and right side presenting the characteristic features of renal cell carcinoma, clear cell type (b) (Hematoksilen&Eozin X200).

Discussion

RCC often metastasizes to the lungs, lymph nodes, bones and the liver. Metastasis to the skeletal muscle is extremely rare and has been reported at rates varying between 0.6% and 1.1% [5]. In literature, 27 cases have been reported of a metastasis of renal cell carcinoma to skeletal muscle. The most common locations are the thigh (30%), the arm (18%) and the shoulder (15%) [6, 7]. Very few cases have been reported in the literature of multiple skeletal muscle metastasis [3-4]. Nabeyama et al. reported metastasis in the left triceps and brachioradialis muscles and Hun et al. reported multiple RCC skeletal muscle metastasis in the psoas and erector spina muscles [3-4]. In the current case, metastasis developed in the left biceps femoris and left deltoid muscle 8 years after left total nephrectomy. Although the musculoskeletal system occupies an extensive area in the body and has a high rate of blood circulation, various theories have been proposed related to the rare occurrence of metastasis. It has been suggested that the tumour cannot settle as angiogenesis is suppressed by the lactic acid produced in the

muscles [8]. It is also thought that the contractions of muscle tissue prevent the spread of cancer [8]. In addition, it has been suggested that the specific receptors which have a role in the spread of RCC are not found in muscle tissue [8]. When the rates are examined of RCC metastasis to skeletal muscle, it is seen that 11% occur 10 years after nephrectomy [8]. Therefore, orthopaedists should bear in mind that in patients with a diagnosis of RCC, soft tissue metastasis may develop in the long-term. Making a diagnosis of metastatic RCC to the skeletal muscle is challenging, because the site is unpredictable, the tumors may be painless, they may go unnoticed when they are small, and can remain asymptomatic for a long time and usually detected only when they reach a large size and start to exhibit symptoms. FDG-PET scan and MRI helps in understanding the morphology of the tumor. Metastasis of carcinoma to skeletal muscle is often seen to be hypointense on MRI T1-weighted images and often hyperintense on T2-weighted images. Contrast MRI taken with the administration of gadolinium is useful in respect of visualising vascularity and necrotic areas. FDG-PET has not been extensively used for the evaluation of distant metastases from RCC. There have been a few case reports about FDG-PET findings in skeletal muscle metastases from different tumor types such as breast and the oesophagus [8]. In our case, the FDG-PET image exhibited an intense FDG uptake lesion, suggestive of metastases. However, the mass found in the biceps femoris muscle by MRI was not detected in the PET scan because the mass was not included in the field of view. MRI or PET alone is not sufficient to differentiate a primary soft tissue tumour from metastasis [7]. For a definitive diagnosis, biopsy is necessary [7]. Treatment of RCC musculoskeletal metastasis is planned according to the clinical status. In cases where there is not widespread metastasis, surgical excision can be applied. Surgical resection of metastatic RCC reportedly improves the outcomes, and five-year survival rates are between %35-50 after surgical therapy for solitary metastasis [8]. In cases with widespread disease involving the lungs, bones or liver, chemotherapy and/or radiotherapy can be applied [8]. Even if a lengthy disease-free period has passed since nephrectomy in a patient who has had a diagnosis of RCC, it must be kept in mind that there could be metastasis to the musculoskeletal system. In these types of cases, MRI is a guide in making the diagnosis. For a definitive diagnosis in doubtful cases, a biopsy should be performed.

Scientific Responsibility Statement

The authors declare that they are responsible for the article's scientific content including study design, data collection, analysis and interpretation, writing, some of the main line, or all of the preparation and scientific review of the contents and approval of the final version of the article.

Animal and human rights statement

All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. No animal or human studies were carried out by the authors for this article.

Conflict of interest

None of the authors received any type of financial support that could be considered potential conflict of interest regarding the manuscript or its submission.

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